DETERMINANTS OF SAVINGS IN ASEAN COUNTRIES

By

SABE, Nyein

THESIS

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

For the Degree of

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Professor Sang Moon HAHM

Professor Hee Suk YUN

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ABSTRACT

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By

SABE NYEIN

This paper investigates the trends of domestic saving in Indonesia, Malaysia, Singapore, Thailand, Vietnam and Philippines. These countries have shown steady rises in their domestic saving rate in the ASEAN community. With the use of fixed effect models, this paper empirically examines the economic determinants underlying the saving trends in this group during the period from 2000 to 2015. The findings reveal that GDP per capita and inflation contribute the most to the rise of saving rate. Another remarkable evidence found is that decreasing dependency young ratio increases the saving rate during the observed period. Other factors, dependency old ratio, real interest rate and unemployment rate show no signals of having a significant impact on the domestic saving rate in the selected countries.

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ASEAN	Association of Southeast Asian Nations
GDP	Gross Domestic Products

CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The amount of domestic savings is one of the most important indicators for the economic growth of a nation. Depending on the amount, it would able to make the nation less dependent on foreign savings and provide capital for the productive sectors, therefore promoting the prosperity of the country. It is also one of the channels through which a nation would be able to create a sea of wealth for the public. Guha-Khasnobis and Mavrotas (2008), as elaborated in Dash and Sahoo (2013), claimed that developing countries rely mainly on domestic savings for the investment.

The saving patterns and behaviours of countries differ widely. The developing or developed circumstance of a country have various levels of rendering saving rates. Moreover, the efficient fiscal and monetary policies of a country influence the rate of domestic savings. For this reason, it is required for countries to adjust their policies in order to maintain their desirable saving rates as it performs the major role in driving the growth of a country.

1.2 PROBLEM STATEMENT

Savings is undeniably considered as a strategic variable in the theory of economic growth, determining both individual and national wellbeing (Teshome et al. 2013, p 66). The fall in saving ratios could hinder investments in productive sectors and also affect the economic stability of the nation. Baliyan and Jain (2016) point out that savings play an important role in economic growth as the savings, in turn, could be reinvested for the mobilization of capital. This would result in investments aiming to speed up the advancement of economy. Okita (1957. p 32) describes that the high rate of voluntary savings is one of the main reasons behind Japan's capital accumulation through the past several decades.

For all these various reasons, this analysis attempts to shed a light on the factors which mainly determine savings in Southeast Asia countries.

ountries. Terada-Hagiwara and Horioka (2012) claimed that there is an increasing trend of saving rates in Developing Asia from 1966 to 2007. (Loayza et al., 2000) also mentioned a double rise of saving rates in East Asian countries over the past three decades. Dash and Sahoo, as well, placed similar emphasis that domestic savings rates of South Asia come third (17 % of GDP) in the world (2013). In 1997, major Asian economic regions were hit hard by the financial crisis. Despite the crisis, there were still countries which attracted global attention with their rapid economic performance. Through uptrends of domestic savings, these countries overcame the financial obstacles and proved themselves as examples for other developing regions. Hence, this study hopes to verify the variables which could have a dominant impact on successful gross domestic savings in six Southeast Asia countries: Indonesia, Vietnam, Thailand, Singapore, the Philippines and Malaysia over the period from 2000 to 2015.

Figure 1: Average Annual Savings Rate in Selected ASEAN Countries (2000-2015)

Undoubtedly, Singapore which is regarded as one of the most developed countries stands first with an average 50% domestic savings to GDP during the period (2000-2015). With consistent growth of savings, it would be able to derive economic gains again. Malaysia is

shown in the second rank with (40%) in savings to GDP ratio among the six countries, whereas Indonesia's savings rate gets the third place.

Important demographic features such as old and young dependency ratios, fiscal and monetary policies such as inflation rate and real interest rate, growth patterns such as real GDP per capita and other related external links such as unemployment rate, are included in this paper for the purpose of investigating factors related to saving rates in the selected countries. Therefore, the main resources for this paper would be derived from well-known theories such as the life expectancy hypothesis, the income hypothesis and monetary policies. M.Husain and Faruqee (1998) found out that age structure is the dominant factor to explain the savings rates in Southeast Asia countries. People work and save more in their prime time. Their tendency and ability to allocate earnings for savings becomes less when they are over the retired period. Their consumption is financed again out of their prior savings during working period and reduces overall saving rates. The age over 65 which is the retirement period for most of the countries, is regarded as the dependency old ratio. The growing retired population is the most important factor for explaining the decline in Japan's household saving rate in baseline model. C.Mark (2017) pointed out the declined saving rate rendered by aged population in Japan.

On the other hand, M.Husain and Faruqee (1998) support the studies of Coale and Hoover (1958) which showed that savings rates decline when the young dependency ratio to working population increases. The age of 15 and under is regarded as the dependency young ratio. For the young, their livelihood and education are provided by their parents. For the households with young dependents, their consumptions are taken out of the family's savings. This worsens the rate of savings for households. As for other decisive factors, the unemployment rate is emphasized. People with no job would be unable to save. Therefore, the higher the unemployment rate, the less the saving rate would be. Wood (1995) noted the relation of

unemployment and saving rates in his research. As for other determinants of domestic savings, Clements (1985) measured the impact of inflation on saving rates in New Zealand. He demonstrated that inflation is one of the crucial factors in determining the rate of savings in a country.

1.3 STUDY OBJECTIVES

As the rate of saving plays a crucial role in financial development, it has become very important to investigate its pattern and responses to monetary and fiscal conversion in the country. Though there are empirical studies on the importance of savings using econometric models in ASEAN countries, they have mostly been focused on the time before 2010. This paper reviews factors which have controlled savings from 2000 to 2015 with the recent trends of domestic savings in ASEAN elaborated. In their study, Lee and Kwack (2004) have urged the need to understand the factors that affect fluctuations in saving rates as they could have important macroeconomic implications. Hence this paper attempts to clarify this with the appropriate use of econometric model and variables. The findings would also provide policy recommendations to carry out adequate policies which could have a positive impact on saving rates in the selected countries.

1.4 RESEARCH QUESTIONS AND HYPOTHESIS

Research Questions

1. Which macroeconomic determinants affect the savings in ASEAN countries most strongly?

Hypothesis (or Claim)

1. High inflation has a positive impact on savings in ASEAN countries.
2. A high GDP per capita has a positive impact on savings in ASEAN countries.
3. The dependency old rate has a negative impact on savings in ASEAN countries.
4. The dependency young rate has a positive impact on savings in ASEAN countries.

5. A high unemployment rate has a negative impact on savings in ASEAN countries.
6. The real interest rate has positive impact on savings in ASEAN countries.

1.5 METHODOLOGY

This research would develop an empirical model using a quantitative method. Panel (Longitudinal) yearly data from 2000 to 2015 would be applied. As for the dependent variable, it would be domestic savings to GDP ratio in ASEAN countries and would be derived from World Bank indicators. As for the independent variables; inflation, dependency old and young ratio, GDP per capita, real interest rate and unemployment rate would be analyzed.

1.6 LIMITATIONS OF THE STUDY

The study would not be without weaknesses. In reality, the Association of Southeast Asia Nations (ASEAN) consists of ten members, however, this paper includes just six members. The selected members contribute more economic benefits in the regions than the rest. They were able to recover from the recession within a short period and even surpassed the expectations of economic growth. That is the main reason for the choice of these countries in the paper. The period just spans from 2000 to 2015 in order to emphasize the experiences of these countries after the crisis. Also, including more variables than already mentioned, is a challenge as there were a lot of missing data in the World Bank indicators.

1.7 ORGANIZATION OF THE STUDY

The paper is organized as follows: a literature review which separates the two parts of theoretical and empirical works is Chapter Two; the model specification and methodology is included in Chapter Three; whereas Chapter Four describes results of empirical studies and related discussions. The last part of the thesis puts forward the policy recommendations for the selected countries.

CHAPER TWO: LITERATURE REVIEW

According to the review conducted by Nga in 2007, Nwachukwu and Odigie in 2009 (as cited in Kassa et al., 2013), savings could help create capital, investment and growth of a country. Similarly, Diaby and Mohamed (2013) highlighted that a high rate of domestic savings is the driver for high growth without use of any foreign savings. Therefore, savings play a crucial role in the economic growth of a nation. A review of existing literature on this was conducted to support the hypothesis of this study.

Theoretical Review

The two dominant theories that explain savings are the life cycle hypothesis and dependency ratio theory. Regarding the determinants of savings, the life cycle hypothesis was designed in 1954 by Modigliani and Brumberg (as cited in Gallego and Butelmann, 2001). The authors proved the relationship between consumption, income and saving. They claimed that consumption was not determined by current income, but people's expectations of high future income. They developed the assumptions that savings have an U-inversed shape as people save less with low income in their working life and more with high income. When approaching the end of life, in their retired age, people save less again with no income in hand.

The dependency ratio theory as determinant of saving was highlighted by Rao (2001). He maintained the view that a nation could enhance its rate of domestic savings more if it experiences a demographic transition such as declining dependent population resulted from reduced fertility. The empirical review conducted by Bloom and Williamson (1997) as cited in Rao (2001) expressed that the rise in working age population could promote per capita productive capacity and enhance the economic growth in some of the East Asian economies. This growth could raise the inclination to save. However, this demographic composition would lose its essence when the aging population increases again and consequently people

would allocate their money for social security expenditures when the system is not adequate. As a result, the average saving rates would decline again.

Empirical Reviews

People would naturally try to secure their future by saving more in the fear of high inflation and economic uncertainties in the country. Jongwanich (2009), Horiako and Wan in 2007 (cited in Coulibaly and Diaby, 2013) supported this finding of a positive relationship between savings and inflation with their findings in Thailand and China.

Mihaescu and Niculescu-Aron (2014) discovered similar results in their paper about the saving behaviour of households in the Central and Eastern Europe before and after the 2008 financial crisis. In their analysis, a cross-section fixed effects one model was utilized to reveal that the inflation rate has a direct influence, with a 1% increase leading to an estimated increase of 0.08% of the saving rate in the authors' study. Experience of the 2008 financial crisis prompted the people in the Central and Eastern Europe to save more for a secured future. At the same time, they asserted the different mindsets of the American people with regards to saving. They referred to Speteanu's (2009) claim that American people saved less during a 1.4% increase in inflation between 1955 and 1964, contrary to a savings increase from 5.8% to 6.9% between 1965 and 1974 when the inflation rate was 4.7%.

Before that, Chaturvedi, Kumar and Dholakia (2008) had also explored the statistical insignificant relation of inflation to savings in their explanation of the inter-relationship between economic growth, savings and inflation in Asia. However, they emphasised on the positive effect of inflation in the study. The weakness in the structures of social security and health sectors in that region had heightened the tendency to save more. Despite their findings that there was no statistical effect of inflation in the study, they referred to Chopra's 1988 study which spoke about the positive effect of inflation on saving significantly in the Indian

economy before 1982. The results of Chaturvedi, Kumar and Dholakia's study used panel data consisting of 13 Asian countries for 15 years, from 1989 to 2003.

Similarly, the paper released by Modiglini and Cao in 2004 (as cited in Yuji and Wan, 2007) also demonstrated the positive and significant impacts of inflation on the household saving rate in their earlier study. They employed time-series data from Chinese provinces for the period from 1953 to 2000. In comparison, Yuji and Wan (2007) asserted that while inflation has a negative and statistical effect sometimes, it also appeared as insignificant at other times in their study of the determinants of household savings in China.

However, Webb, S.B, Schmidt-Hebbel, K and Corsetti, G (1992) insisted that inflation has had no clear impact on saving. They utilized household data sourced from the U.N System of National Accounts in a sample of 10 countries, and showed the negative impact of inflation on savings where it has no statistical significance. The correlation between the real interest rate and inflation rate led the authors to enter these two variables separately to check their impact on savings. Inflation becomes significant when the real exchange rate is omitted, but the later shows no significance in return when inflation is excluded.

Previously, Clements (1985) had hypothesized a positive relationship between the saving ratios and inflation rate. His hypotheses emerged from the fact that in perceiving future inflation, people tended to save more in fear of facing economic instability. He also demonstrated contrary views to some researchers who had held the notion of a negative relationship between these two variables. Their views described that "inflation may have the effect of raising the required rate of return on savings and lowering the actual rate of return" (p 12). Finally, Clements (1985) found out that there was also a negative relationship between inflation and the saving ratio in New Zealand in contrast to his first hypotheses. This meant that inflation and savings could have positive or negative relations.

Next, Staehr and Kukk (2015) explored the relations of inflation, real interest rate and

unemployment rate with both household and corporate savings. The authors employed yearly data (1995-2012) for 10 Central and Eastern European using the Arellano-Bond GMM estimation, the LSDV estimation and the bias-corrected LSDV estimation. Their findings indicated that unemployment rate has had no significant relations with both savings. As for the real interest rate, it has had no influence on corporate savings but had a positive relationship with household savings. Household saving has had a rise of 0.13 percent point with a 1 percent point of inflation.

Then, (Samiei et al., 1998) conducted their studies with a panel spanning the time period of 23 years (1971-93) for 21 industrial countries and 12 years (1982-1993) for 40 developing countries. Real interest rate, inflation and per capita GDP relative to U.S were discovered positively to be linked with private savings whereas dependency ratio was negatively affected in OLS and first difference estimates.

Lastly, Baharumshah and Thanoon (2007) presented how inflation, dependency ratio, interest rate and per capita influence private savings in Malaysia with the cointegration approach. They discovered that the rate of private savings was negatively determined by dependency ratio and the real interest rate at a 5% significant level in the long run.

Based on different studies, whether theoretical or empirical, there are varying arguements. Some researchers have highlighted the positive impact of chosen variables on savings while others have showed the contradictory views. Additionally, the literature continues to indicate that countries practice different saving targets depending on their economic condition. Therefore, this study has built on previous studies to examine the effect of macro determinants in ASEAN countries, in particular, focusing on the inflation, dependency ratio, per capita GDP, real interest rate. Furthermore, other relevant variables such as unemployment would also be included in the analysis.

CHAPTER THREE: MODEL SPECIFICATION AND METHODOLOGY

3.1 DATA SOURCES

With the purpose of using a consistent source for all variables, the data applied in this paper has been derived from the same database, the World Bank Indicators. It is one of the most recommended sources for the previous, current and future empirical studies on various sectors. The soundness and consistency of data in the studies is unquestionably strong when using this source therefore, data from here would be used.

3.1.1 TYPES OF DATA AND VARIABLES OF INTEREST

The time period used in this paper, is limited to 16 years from (2000-2015). The data type is annually panel (longitudinal) as quarterly or monthly data cannot be traced fully for attended variables. The investigation is done on the six countries (Indonesia, Thailand, Vietnam, Philippines, Singapore and Malaysia) as they showed the best economic performance in Southeast Asian region. The variables described below are decided as main determinants of domestic savings in ASEAN countries.

TABLE 1: LIST OF VARIABLES

Dependent Variable	SAV	Gross Domestic Savings (% of GDP)
Independent Variables	INF	Inflation, GDP deflator (annual %)
	LPC	Log of GDP Per Capita (Constant 2010 USD)
	LRINT	Log of Real Interest Rate (%)
	UNEM	Unemployment, total (% of total labor force) (national estimate)
	DEPO	Age Dependency Ratio, Old (% of working-age population)
	DEPY	Age Dependency Ratio, Young (% of working-age population)

The variables of interest are discussed in depth as follows;

3.1.1.1 DEPENDENT VARIABLE

a) Ratio of Domestic Savings to Gross Domestic Products (SAV)

According to the World Bank, "Gross domestic savings are calculated as GDP less final consumption expenditure (total consumption)". This is taken as the saving percentage of gross domestic products according to previous empirical research performed. As it is mentioned as domestic savings, it is composed of savings from household sector as well as private and public sectors.

3.1.1.2 EXPLANATORY VARIABLES

a) GDP Growth Per Capita (LPC)

World Bank defines this variable as "GDP per capita is gross domestic product divided by midyear population. Data is in constant 2010 U.S. dollars." The author changed the data to natural logarithm in order to explore its more significant effects. Gross Domestic Per Capita was applied in the estimates to discuss the relationship between income level and savings. People could have opportunities and desires to save more if their per capita becomes more. As per capita varies across the countries, saving rates achieved differ at each country level. With this insight on the effect of per capita in each country in mind, this signals the rising and falling of saving rates.

b) Inflation (INF)

The variable is measured as an annual % with GDP deflator. There are a lot of ambiguous definitions for this variable. It could lead to higher savings when people take high inflation as an economic uncertainty. However, people could also think the same when they face a financial crisis or even higher inflation. Therefore, their tendency to save, would increase at the present time as a precautionary action. Higher inflation rates could hence, raise saving rates. On the other hand, inflation erodes the purchasing power of the public. Their allocation to save is sacrificed because of increasing inflation. When trying to maintain their usual

consumption at higher inflation period, people would fail to save. Hence, inflation could also have negative dominance on the rate of savings. As the rate of domestic savings is also inclusive of household sectors, a high inflation would affect the propensity of households to save and lead to a fall in domestic savings rates.

c) Real Interest Rate (LRINT)

As indicated by the World Bank, this variable is the lending interest rate adjusted for inflation as measured by the GDP deflator. The author has changed the data to a natural logarithm in order to explore its more significant effect. When the lending rate is high, it deters investment opportunities. Again, a high lending rate becomes a barrier for the people in their investment opportunities and they tend to save more instead of investing. Likewise, there is a hike in investments when real interest rate declines and people prefer investment than savings. For this reason, the real interest rate performs a major role in determining the domestic savings rate. It could also directly affect private sector savings.

d) Dependency Old Ratio (DEPO)

The World Bank derives its data from age distributions according to the United Nations Population Division's World Population Prospects. As defined by the World Bank, dependency old ratio is the ratio of people older than 64 to the working age population (15-64). People dis-save when they get older, while they are retired when they are 60 or over. The savings which were accumulated in their working period goes into a downward trend as the retired person would use their savings to maintain their consumption. Consequently, domestic savings show a decrease with a higher dependency old ratio. However, there are also controversial views on this relation between the dependency old ratio and savings. In Asian countries, children tend to feel more obliged to look after their aged parents. In this regard, they work more and the decline in the savings rate of older people is offset by the higher

working capacities of the younger generation. Hence, savings and dependency old ratio have been found to not be significantly related in research on certain parts of Asia.

e) Dependency Young Ratio (DEPY)

The World Bank derives its data from the age distributions used by the United Nations Population Division's World Population Prospects. As presented by the World Bank, it is defined as the ratio of people younger than 15 to the working age population (15-64).

It is widely accepted that people under 15 are supported by the parents for their consumption and education. Where there are more younger dependents, households are not able to save as much as they want. Their allocations for savings are moved for the consumption of young dependents. Therefore, the number of young dependents negatively affects the household savings. However, there are different views on the assumption that parents work more to ensure a better life for the younger generation. Moreover, there has also been experience of a decreased trend in the young dependency ratio leading to higher domestic savings. People tend to work and save more when they have no young dependents who could finance them in their old days.

f) Unemployment (UNEM)

The World Bank refers to this variable as the share of the labour force who are in the situation to get jobs or who are looking for jobs. World Bank adopts this data from the International Labour Organization.

A high unemployment rate controls saving rates negatively as increasing unemployment rate halts the trend in domestic savings. People out of work are not able to contribute to the national savings level. Thus, this is regarded as one of the determinants of domestic savings.

3.2 MODE SPECIFICATION

3.2.1 PANEL DATA

E.Brand and A.Bollen (2010) asserted that with the use of panel data, sophisticated analyses are now more available than previously. Panel data consists of two aspects; time period which is set as 't' and individual id which is set as 'i' in the model. Panel data has proven itself to be more convenient for researchers to implement in papers on individuals, states, regions, countries and firms through the passing of time. It allows the researchers to keep track of the changing circumstances of individuals and countries. The analysts could carry out continuous research to check whether the explanatory variables have an insignificant or positive or negative impact on dependent variables through varying time periods. In the time series data, missing data is not allowed. However, panel data permits the scholars to conduct research with missing data across some periods for focused respondents. The most well-known advantage of panel data is that it would be able to control all time-invariant variables which could bring heterogeneity bias to the model. If these time-invariant has a relationship with the explanatory variables, heterogeneity occurs. The expected impact of variables is not shown correctly with this problem. Thus, applying this panel data is the most strategic tool to remove heterogeneity problem in empirical research.

However, the data type does not come without weaknesses. It is not an easy task to monitor selected individuals all the time. Some respondents may change their minds about participating in the questioning process or the researchers could lose trace of them for a variety of reasons. Moreover, it could be costly to do consecutive research. The other factor which could makes panel data lose its essence, is that the analysts sometimes have ambiguity over which method is more appropriate between fixed and random effects.

3.2.2 FIXED EFFECT MODEL

Time-invariant variable remain in the error term and relate with it. If these factors link with other explanatory covariates, an error term reduces the significant impacts of key variables. For this reason, the researchers are not able to detect the actual level of associations between explanatory and dependent variables. Unlike other models, fixed effect model addresses this issue by allowing unchanging-time variables related to the explanatory variables. Time-invariant variables could involve constant characteristics of a country such as geographic features, cultural value, education level and so on. A fixed effect model could have effective control on these problematic variables and allow the scholars to discover their desired research goals. The fixed effect model designed for this paper is as follows;

$$SAV_{it} = \beta_1 INF_{it} + \beta_2 LPC_{it} + \beta_3 LRINT_{it} + \beta_4 UNEM_{it} + \beta_5 DEPO_{it} + \beta_6 DEPY_{it} + \alpha_i + \varepsilon_{it} \quad \text{--------(1)}$$

$$SAV_{it} = \beta_1 INF_{it} + \beta_2 LPC_{it} + \beta_3 UNEM_{it} + \beta_4 DEPO_{it} + \beta_5 DEPY_{it} + \alpha_i + \varepsilon_{it} \quad \text{--------(2)}$$

$$SAV_{it} = \beta_1 INF_{it} + \beta_2 LPC_{it} + \beta_3 DEPO_{it} + \beta_4 DEPY_{it} + \alpha_i + \varepsilon_{it} \quad \text{--------(3)}$$

Where:

SAV_{it} = gross domestic savings (% of GDP)

INF = inflation rate

LPC = logarithmic transformation of GDP per capita

LRINT= logarithmic transformation of real interest rate

UNEM= unemployment rate

DEPO = dependency old ratio

DEPY = dependecy young ratio

α_i = time-invariant variables

ε_{it} = error term

3.2.3 RANDOM EFFECT MODEL

It is an another important model which could implicate and solve the problems of endogeneity issues. It is also applied to some extent when detecting the time-invariant factors in the research. Unlike the fixed effect model, the random effect model leads to the assumption that control covariates are uncorrelated with time-unchanging factors. Compared with the former model, it has a stronger applications to lessen standard errors and contribute to more significant results.

3.2.4 HAUSMAN TEST

This test is conducted for the choice of more appropriate models between fixed effect and random effect models. Both models are aimed to reinforce the removal of heterogeneity issues encountered in most of the studies. With the grasp of consistent panel data, the researchers often get confused as to which model to choose. This test decides the option for the researchers. If p-value is >0.05, the fixed effect model is recommended to be applied. If p-value is>0.05, the random effect model is better than the fixed effect model.

CHAPTER FOUR: RESULTS OF EMPIRICAL ANALYSIS AND RELATED DISCUSSIONS

4.1 DESCRIPTIVE ANALYSIS

In order to present a clear description of empirical evidence for this paper, the data included is explained as follows with the tables and graphs below.

TABLE 2: DESCRIPTIVE STATISTICS

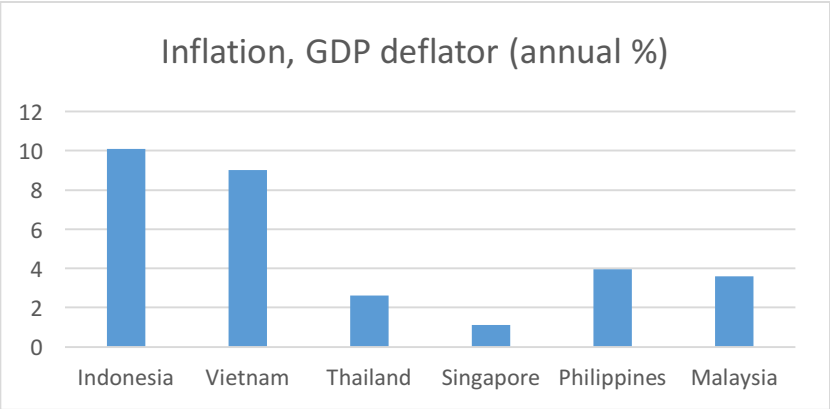
Variables	Mean	Std.Dev.			Min	Max	Obs
		Overall	Between	Within			
SAV	32.70249	11.17245	11.771	2.85386	14.94229	54.28837	96
INF	5.071717	5.142467	3.626364	3.920568	-5.015799	22.67332	96
LPC	8.455644	1.181946	1.273719	0.1754891	6.669059	10.86369	96
LRINT	1.280966	0.8120427	0.2791244	0.7752558	-3.37355	2.51142	83
UNEM	4.645368	3.011698	2.957718	1.292145	0.19	11.85	95
DEPO	9.131024	2.507264	2.514735	0.9803014	5.541113	16.05016	96
DEPY	40.10763	11.87673	11.92732	4.61063	21.35716	66.06184	96

Source: Author's Own Computation

4.1.1 SAMPLED COUNTRIES AND THEIR MEAN VARIABLES

To investigate the status of the sampled countries in each variable, the annual average tables for the period of (2000-2015) are elaborated as follows;

FIGURE 2: Inflation in Selected ASEAN Countries (2000-2015)



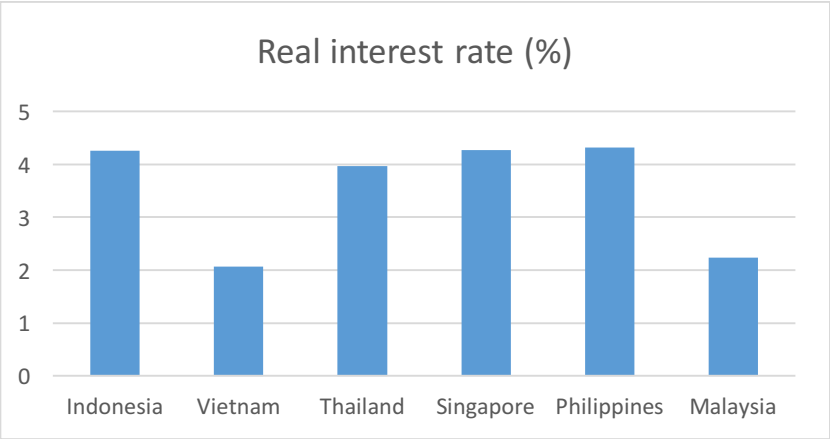
Indonesia, which is regarded as the largest economy in the Southeast Asia region, is found to have the highest inflation level of 10% inflation as compared with the other five countries. If the public takes this high inflation as a sign of macroeconomic uncertainty, Indonesian households would save more in order to cushion themselves against the adverse financial risks. Meanwhile, Singapore is seen to have the lowest average inflation rate 1.13% over a period of sixteen years.

FIGURE 3: GDP Per Capita in Selected ASEAN Countries (2000-2015)

The above graph presents per capita gross domestic products within six ASEAN countries. It shows that Singapore is the leading country in terms of the highest income level for its people. It stands at the US$42,585 for the average level over a period of 16 years. Vietnam is

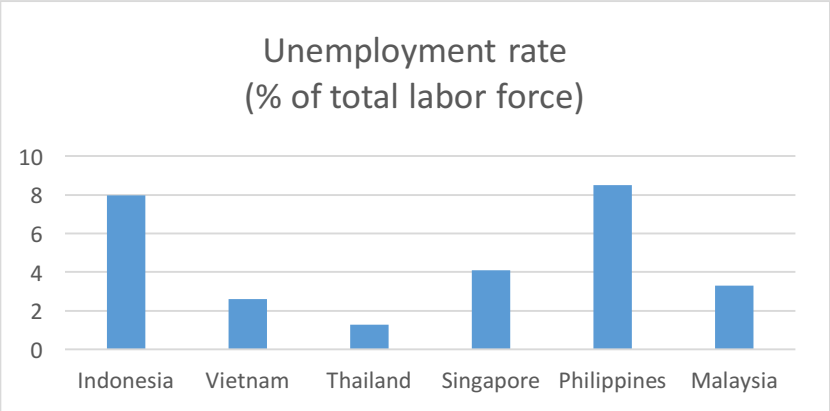
observed as having the lowest level among the six countries, achieving US$1,197 for its average per capita. Malaysia which is situated near Singapore, comes second.

FIGURE 4: Real interest rate (%)in Selected ASEAN Countries (2000-2015)



It is revealed that the real interest rate of Indonesia, Thailand, Singapore and Philippines remained nearly the same within the period from 2000 to 2015.

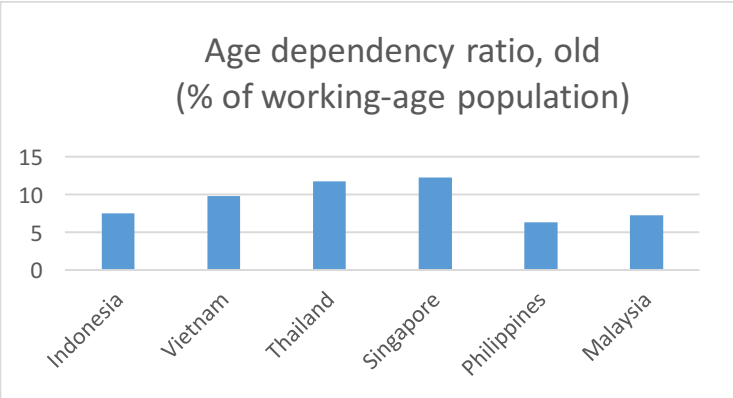
FIGURE 5: Unemployment Rate (% of total labor force) in Selected ASEAN Countries (2000-2015)



As seen in the graph, the Philippines retained the highest unemployment rate at 8.51% from amongst the six countries. Brooks (2002) ascertained that unemployment could be reduced in the country with a high economic state and a reasonable increase in the minimum wage in the

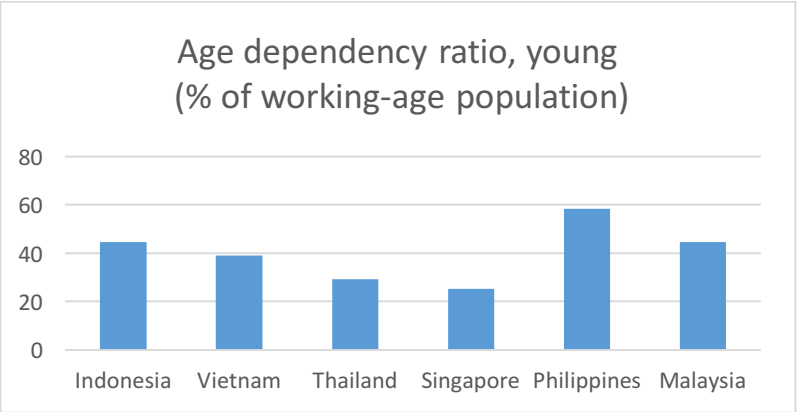
ADB report on “Why is unemployment high in the Philippines?”. On the other hand, Yuvejwattana (2015) expressed that Thailand is acknowledged as one of the countries with a low unemployment rate. It has an average of 1.27%, nearly 7 times lower than the Philippines.

FIGURE 6: Dependency Ratio (Old) in Selected ASEAN Countries (2000-2015)



With the concern of an ageing structure growing in the world, Singapore and Thailand also have the same worries. Singapore and Thailand both suffer from one of the highest dependency old rate among the six countries. Their average dependency old rate of 12.28% and 11.77% to their working-aged populations respectively, has been steadily increasing over the period of sixteen years.

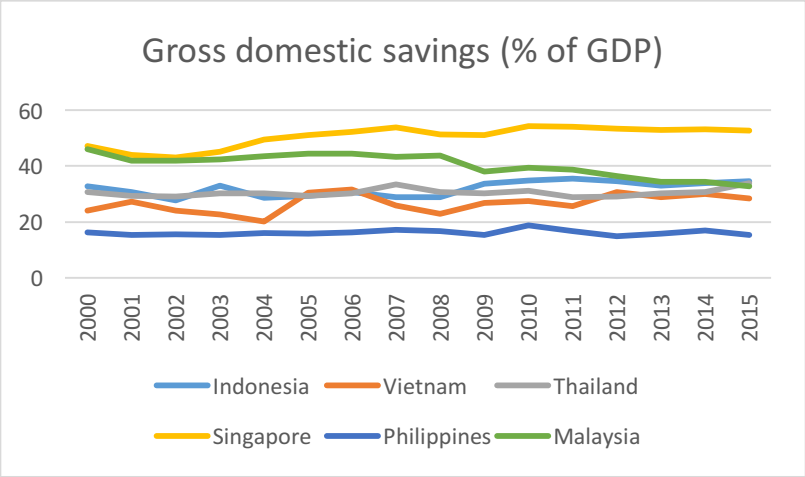
FIGURE 7: Dependency Ratio (Young) in Selected ASEAN Countries (2000-2015)



While comparing the ratio of its country's young dependents to the working-aged population, the Philippines comes out as the country with the highest percentage at 58.26%. Malaysia and Indonesia are not very different with 44.61 % and 44.46% respectively. A note-worthy factor discovered is Singapore's ratio. Though it is the topmost in the dependency old ratio, it was also revealed to have the lowest young dependents rate among the six countries.

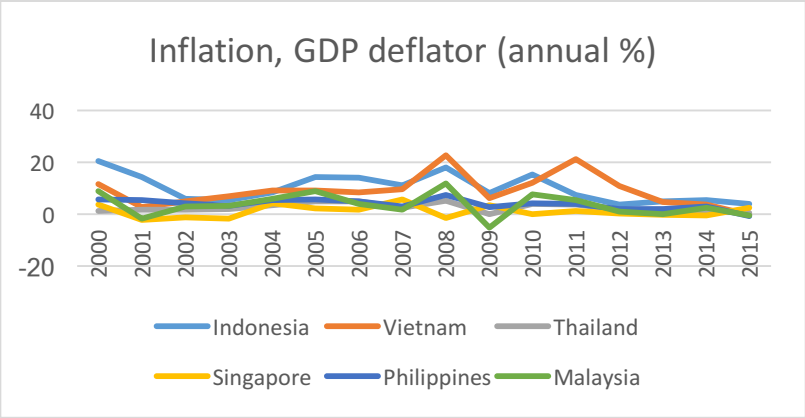
4.1.2 VARIABLE GRAPHS FOR SAMPLED COUNTRIES

GRAPH 1: GROSS DOMESTIC SAVINGS (% OF GDP)



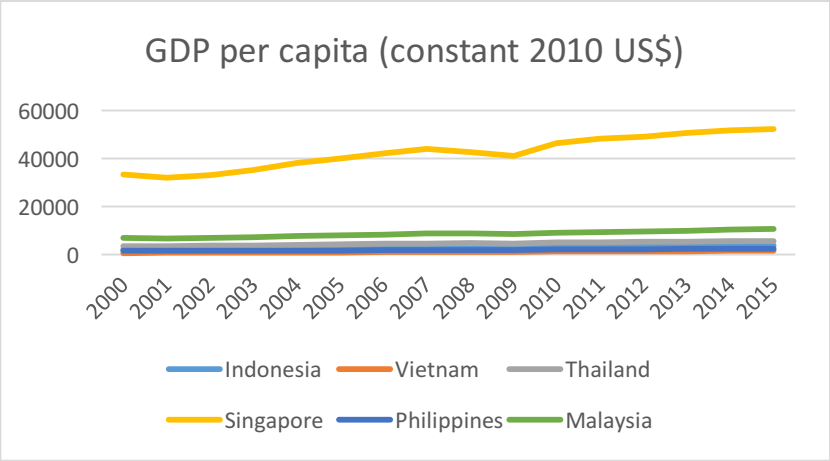
Singapore's domestic savings ranged from 43% to 55% during the observed period. The highest rate was 54.29% in 2010 whereas the lowest was 43.13% in 2002. Before 2005, the rate was under 50%. Singapore continues to experience a constant trend in savings. Malaysia stands second in this with the trends in its domestic savings rate, declining from 44% in 2008 to 38% in 2009. It faced a bottom rate of 32.74% during 2015. The graph also captured the bottom level of saving rates in the Philippines, when its savings rate fluctuated from just 14% to 19% during the stated period, with 18.73% being the most highest it achieved. As such, there is a huge difference between Singapore and Philippines in terms of savings level.

GRAPH 2: INFLATION, GDP DEFLATOR (ANNUAL %)



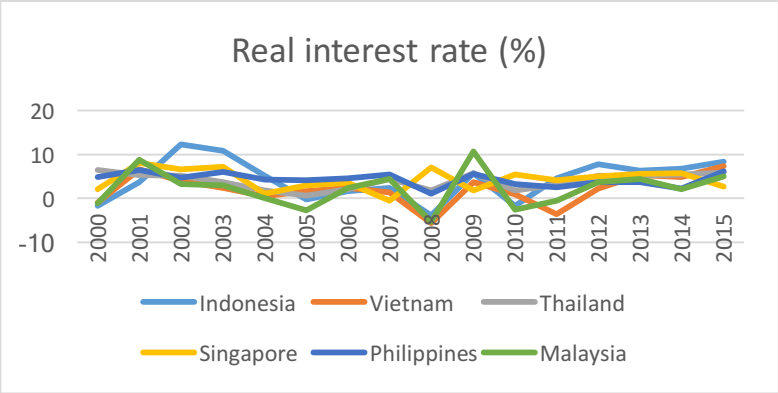
The graph grasps the rapid movement of inflation in every country. As for Indonesia, there is a deep fall about 15% from 20% in 2000 to 5% in 2002. Inflation doubled from 7% in 2003 to 14% in 2007. The second ranked for high inflation was Vietnam. It could be seen that Vietnam suffered from the highest inflation rate of 23% in 2008 and then a dramatic decline up to 6% in 2009. It slipped back to 21% in 2009.

GRAPH 3: GDP Per Capita (CONSTANT 2010 US$)



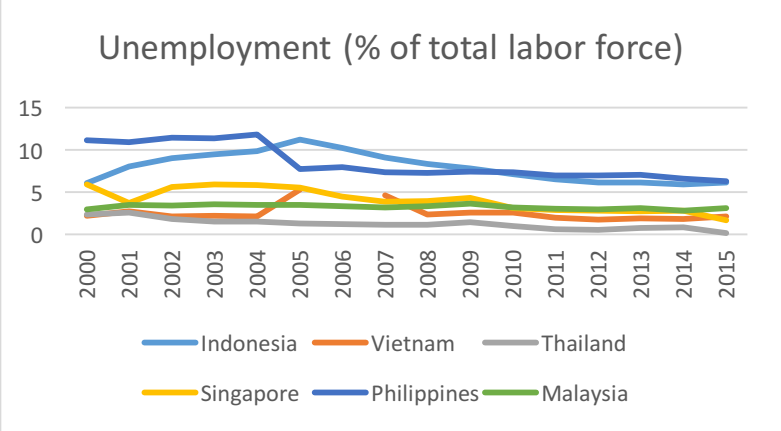
When measuring the GDP per capita of six countries, the obvious gap between Singapore and its other peers is illustrated. The author perceived a gradual increase in per capita of Singapore from 2000 to 2008. Despite this, there was also a noticeable fall in 2009. The per capita of the other countries is viewed as being under US$10,000 until 2015 with Vietnam in last position.

GRAPH 4: REAL INTEREST RATE (%)



A lot of changes have happened in all the countries which are concerned with real interest rate. In 2008, Vietnam and Malaysia reached a remarkable negative interest rate of -5%. Another interesting point is Indonesia. The rate had a dramatic increase up to 12.32 in 2002 from -1.65 in 2000. In contrast, Singapore experienced a prominent drop from 8.07% in 2001 to -0.50% in 2007.

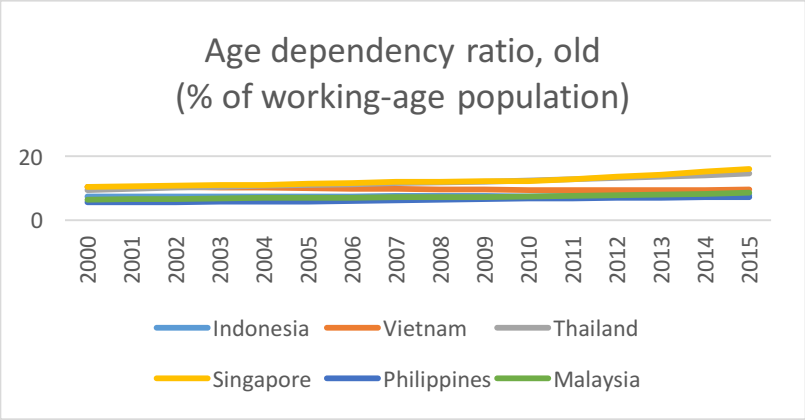
GRAPH 5: UNEMPLOYMENT (% OF TOTAL LABOR FORCE)



Despite its high unemployment rate before 2005, the Philippines reduced its rate to 7.74% in 2005 from 11.85% in 2004. From that time onward, a desirable decline was detected during the period observed. In contrast to the Philippines, Indonesia had an expanding unemployment rate until 2005 before sinking gradually. On the other hand, Thailand enjoyed a favourable rate with just 3% as its highest within sixteen years. It also had an unbelievable rate of 0.19% in 2015. This low rate of unemployment surprised the world.

GRAPH 6: AGE DEPEDENCY RATIO, OLD

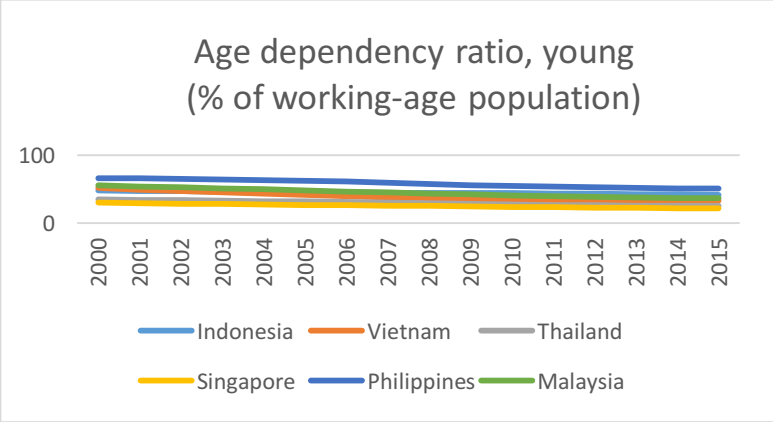
(% OF WORKING-AGE POPULATION)



It was found that dependency old ratio has had no steep climb or slump among six countries. Each country has been steadily rising for their respective ratios. Every year of dependency ratio has also revealed an upward trend. In the future, an ageing population would be one of the main concerns to address in the Southeast Asia region.

GRAPH 7: AGE DEPENDENCY RATIO, YOUNG

(% OF WORKING-AGE POPULATION)



In contrast to the dependency old ratio, this variable was unveiled to have had a downward trend during the period of focus. Thailand and Singapore had no significant gap in the rate and Malaysia and Vietnam were also perceived to have similar patterns.

4.2 REGRESSION RESULTS

4.2.1 ESTIMATION WITH FIXED EFFECT MODELS

TABLE 3: FIXED EFFECT MODEL RESULTS

SAV	FE 1	FE2	FE3
INF	0.334** (2.23)	0.112* (1.85)	0.107* (1.69)
LPC	23.10*** (6.54)	22.54*** (6.81)	23.25*** (7.07)
LRINT	0.524 (1.11)		
UNEM	-0.312 (-1.17)	-0.306 (-1.31)	
DEPO	-0.211 (-0.70)	-0.229 (-0.78)	-0.103 (-0.35)
DEPY	0.758*** (6.04)	0.763*** (6.62)	0.760*** (6.36)
_cons	-192.5*** (-5.61)	-185.8*** (-5.79)	-193.9*** (-6.15)

t statistics in parentheses

* p<0.01, ** p<0.05, *** p<0.001

Source: Author's own computation

The author applied fixed effect model at first with the aim of controlling country unobserved features. In FE1, all six variables were regressed on domestic savings. In FE2, LRINT was excluded to detect the changing impact of other variables. In FE3, the similar action of removing LRINT and UNEM was performed with the same purpose.

As per FE1, INF was positively correlated with SAV at 5% significant level. Koskela (1982) found out a similar result in his study of "Inflation, Tight Money and Household Saving Behavior: Finnish Evidence". Another variable, LPC also has had a statistically positive strong impact on SAV at 1% level. As for LRINT, there was a positive relationship with savings as anticipated despite no statistical significance. Moreover, UNEM was noticed to have had a negative link with SAV with no statistical impact. Similarly, DEPO proved to

have had a negative relationship in line with what was uncovered by theoretical reviews. Unfortunately, it did not have a statistical correlation with SAV. The last variable DEPY implied a positive relationship with SAV. This was contrary to the previous hypothesis. However, if taken from a different point of view, all sampled countries have had downward trend in the dependency young ratio which has led to high domestic saving rates. DEPY was statistically significant at 1% level.

The Model FE2 and FE3 presented no different impact of variables though LRINT and UNEM are eliminated. The signs of the variables remained unchanged as in FE1. However, the coefficient of INF became less and significant statistically at only 10% in FE2 and FE3 when LRINT and UNEM were taken away.

4.2.2 ESTIMATION WITH RANDOM EFFECT MODELS

TABLE 4: RANDOM EFFECT MODEL RESULTS

SAV	RE1	RE2	RE3
INF	1.319*** (5.30)	0.517*** (4.58)	0.0958 (1.37)
LPC	10.25*** (12.34)	8.865*** (14.24)	12.14*** (6.65)
LRINT	2.509** (3.01)		
UNEM	-1.424*** (-4.21)	-0.787*** (-3.30)	
DEPO	-0.986** (-2.22)	-0.718 (-1.65)	0.218 (0.69)
DEPY	-0.0729 (-0.59)	-0.125 (-1.15)	0.389*** (4.32)
_cons	-44.26*** (-3.42)	-29.76** (-2.74)	-88.05*** (-4.82)

t statistics in parentheses
* p<0.01, ** p<0.05, *** p<0.001
Source: Author's Own Computation

In the table RE1, the variables INF and LPC had the expected direction with 1% statistical significance while LRINT was described to have 5% level. Contrary to previous fixed effect estimates, UNEM expressed an obvious significant level of 1% with a negative correlation. With the random effect model, DEPO became a negative influential variable on SAV at 5% level. Although DEPY showed negative coefficient, it is not a statistical determinant of SAV. INF was found not to be determinant of SAV in RE3 when RINT and UNEM were omitted. LPC remained unchanged through all models. DEPO was discovered to have negative statistical dominance on SAV just in RE1. It still showed the same direction in RE2 but was a reverse sign and had no significance in RE3. As for DEPY, the positive statistical influence was detected only in RE3, not in RE1 and RE2 which described the variable to have had a negative impact.

4.2.3 HAUSMAN TEST RESULTS

The test to distinguish between fixed effect model and random effect model was conducted. It illustrated the fixed effect model to be appropriate to be employed in the paper. However, the author made attempts to emphasize how the variables exerted their impact differently with an alternative model.

TABLE 5: HAUSEMAN TEST RESULTS

```
. hausman FE1 RE1

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |      FE1          RE1         Difference          S.E.
-------------+------------------------------------------------------------
         INF |     .334279     1.319152       -.9848728                .
         LPC |    23.09917     10.24754        12.85164        3.435712
      LRINT |     .5243439     2.509216       -1.984872                .
        UNEM |    -.3124821    -1.423933        1.111451                .
        DEPO |    -.2110528    -.9859976        .7749448                .
        DEPY |     .7576572    -.0728882        .8305454        .0230109
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       26.65
                Prob>chi2 =      0.0002
                (V_b-V_B is not positive definite)
```

CHAPTER FIVE: SUMMARY CONCLUSION AND POLICY IMPLICATIONS

5.1 CONCLUSIONS

Widely-employed determinants of domestic savings were selected in this paper and stressed their impact in the sampled ASEAN countries over the period from 2000 to 2015. The strength of this study was that it described the domestic savings rates in these countries until the recent year of 2015. As of the time of writing, there have been no other papers that have conducted research on this topic up until then. The findings of the study could also highlight the economic status of each country within the ASEAN community and their economic performance. If united, each individual country would be able to contribute to the common wealth of ASEAN. For this reason, it is important to discover what factors most determine their economic growth. As domestic savings is highly regarded as one of the main drivers to build a strong economy, the paper set out to investigate the reasons behind the various saving patterns of selected ASEAN countries.

5.2 POLICY IMPLICATIONS

As highlighted by the Hausman Test, fixed effect model estimates were recommended for the process of policy recommendations. The results represented inflation as main determinant of domestic savings rates at a 5% significant level. The positive impact of inflation was discovered as per the expected hypothesis. The findings have led to the conclusion that people in ASEAN countries save mostly to guard against macroeconomic uncertainties; meaning that they save as precautionary measures against economic risks in the future. The more they save, the more secure they feel. The domestic saving rate has seen increasing trends in the region because of a rise in household savings. When considering from an alternative point of view, their accumulative savings could be utilized again for capital formation which would help to elevate productive sectors again. However, if seen from a

negative point of view, a high inflation rate could undermine the economy of a country in the long-term as it would erode the real value of money and purchasing power of the public. Therefore, ASEAN members would need to maintain the balance between inflation and deflation. This is also an important matter for the policymakers to consider when implementing adequate monetary policies and employing effective tools in order to address the people's concerns over uncertain economic situations.

GDP per capita was also found to be a prominent indicator of domestic savings in the six countries. It revealed having a positive effect on savings at a 1% significant level in line with prior evidence. As per the explanation of previous studies, saving trends retain an uptrend when people achieve more per capita. GDP per capita is perfectly indicative of the economic status of a country as a higher per capita refers to the healthy state of the economy of a country. In order to achieve this, governments would need to be attentive of GDP per capita and maintain a sustainable productivity level for the well-being of the public.

Real interest rate was found to have no statistical significance although it had the correct positive sign. It is the lending interest rate people have to sacrifice for investments as a rise in lending rate hinders the willingness of people to invest. A high real interest rate would be a burden in the long term. People tend to save more instead of investments with high interest rates. As a result, saving rates would then show uptrends. The findings exhibit some important implications that governments need to design appropriate interest rate policies to preserve the financial stability of their countries. They would be required to implement sound and efficient financial systems in order to win the confidence of the public when they need financial assistance for investments.

Unemployment rate was revealed to have no significant relations with domestic savings in the region. Despite having no impact, the negative sign is consistent with macroeconomic theories. When people are unemployed, they possess nothing to keep as their savings. The

more unemployment a country encounters, the less saving rates it would have. This poses a concern for every country in the ASEAN community. Therefore, the government needs to set rein on unemployment rate. In saying so, the creation of job opportunities becomes important. The government would have to raise the country's investments and production sectors before unemployment becomes a threat to the country's development.

Dependency old ratio has no statistical relations with domestic savings in the region. However, it could still indicate that increasing trend of old dependents affects domestic saving rates in ASEAN countries. The consumption, physical and social issues of those old dependents are financed out of allocations for savings. This means a reduction in saving rate. On the other hand, dependency young ratio is discovered to have a strong positive dominance on saving rates in the region. With fewer young dependents, households could accumulate more savings, which would lead to high saving rates. This sounds desirable for the countries in the current period as they need not to rely on foreign savings if they have sufficient domestic savings within the country. However, after some time, they could face issues of a working aged population shortages with the present declining young dependency ratio. The capacities of working population would be reduced and render the economy impaired. Therefore, it is essential for ASEAN countries to take preparations in order to address this issue beforehand. It is recommended that the governments would need to offer incentives and assistance to increase family sizes in the households such as waiving education fees, providing a sufficient health insurance system and supportive facilities for the households with the young dependents.

More studies on domestic saving patterns are required to keep the pace with changing situations of countries in ASEAN community. With the achievement of a bigger combined economy, ASEAN's economic power could go global. Although this paper did not cover in whole, all the indicators of domestic savings regarding the whole ASEAN community, its

findings would help policy makers in the implementation of effective monetary and fiscal policy. Hence, in the future, it would be very useful to conduct further research on all ten members of ASEAN as each country possesses unique features to influence the world with their own economic strength.

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APPENDICES

APPENDIX A

STATA Output for Tabe 3. Model (FE1)

```
. xtreg SAV INF  LPC  LRINT UNEM DEPO DEPY,fe

Fixed-effects (within) regression               Number of obs      =        82
Group variable: ID                              Number of groups   =         6

R-sq:                                           Obs per group:
     within  = 0.4510                                         min =        11
     between = 0.6240                                         avg =      13.7
     overall = 0.6021                                         max =        16

                                                F(6,70)            =      9.58
corr(u_i, Xb)  = -0.8855                        Prob > F           =    0.0000
```

SAV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
INF	.334279	.1500133	2.23	0.029	.0350869	.6334712
LPC	23.09917	3.53462	6.54	0.000	16.0496	30.14875
LRINT	.5243439	.4723943	1.11	0.271	-.4178168	1.466505
UNEM	-.3124821	.2679017	-1.17	0.247	-.8467952	.2218309
DEPO	-.2110528	.3007423	-0.70	0.485	-.8108644	.3887587
DEPY	.7576572	.1253555	6.04	0.000	.5076435	1.007671
_cons	-192.5268	34.31758	-5.61	0.000	-260.971	-124.0825
sigma_u	16.540295					
sigma_e	2.1951709					
rho	.98269119	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(5, 70) = 46.91                     Prob > F = 0.0000
```

APPENDIX B

STATA Output for Tabe 3. Model (FE2)

```
. xtreg SAV INF  LPC  UNEM DEPO DEPY,fe

Fixed-effects (within) regression               Number of obs      =        95
Group variable: ID                              Number of groups   =         6

R-sq:                                           Obs per group:
     within  = 0.4226                                         min =        15
     between = 0.6374                                         avg =      15.8
     overall = 0.6163                                         max =        16

                                                F(5,84)            =     12.29
corr(u_i, Xb)  = -0.8916                        Prob > F           =    0.0000
```

SAV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
INF	.1124477	.0606979	1.85	0.067	-.0082568	.2331521
LPC	22.53683	3.308674	6.81	0.000	15.95717	29.11649
UNEM	-.3060581	.2327767	-1.31	0.192	-.76896	.1568439
DEPO	-.2291562	.2949223	-0.78	0.439	-.8156415	.3573291
DEPY	.7626861	.115131	6.62	0.000	.5337354	.9916367
_cons	-185.8437	32.11825	-5.79	0.000	-249.7143	-121.973
sigma_u	16.094747					
sigma_e	2.2667939					
rho	.98054974	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(5, 84) = 60.13                     Prob > F = 0.0000
```

APPENDIX C

STATA Output for Tabe 3. Model (FE3)

```
. xtreg SAV INF  LPC DEPO DEPY,fe

Fixed-effects (within) regression               Number of obs      =         96
Group variable: ID                              Number of groups   =          6

R-sq:                                           Obs per group:
     within  = 0.3809                                         min =         16
     between = 0.6222                                         avg =       16.0
     overall = 0.5968                                         max =         16

                                                F(4,86)            =      13.23
corr(u_i, Xb)  = -0.9041                        Prob > F           =     0.0000

------------------------------------------------------------------------------
         SAV |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         INF |    .107004   .0631653     1.69   0.094    -.0185645    .2325725
         LPC |   23.24518   3.286049     7.07   0.000     16.71273    29.77763
        DEPO |  -.1032874   .2961677    -0.35   0.728    -.6920494    .4854745
        DEPY |   .7597529   .1193792     6.36   0.000     .5224349    .9970709
       _cons |  -193.9219   31.53896    -6.15   0.000    -256.6193   -131.2246
-------------+----------------------------------------------------------------
     sigma_u |  17.163896
     sigma_e |  2.3600858
         rho |   .98144379   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(5, 86) = 65.64                     Prob > F = 0.0000
```

APPENDIX D

STATA Output for Tabe 4. Model (RE1)

```
. xtreg SAV INF  LPC  LRINT UNEM DEPO DEPY,re

Random-effects GLS regression                   Number of obs     =         82
Group variable: ID                              Number of groups  =          6

R-sq:                                           Obs per group:
     within  = 0.1254                                         min =         11
     between = 0.9418                                         avg =       13.7
     overall = 0.8618                                         max =         16

                                                Wald chi2(6)      =     467.69
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000
```

SAV	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
INF	1.319152	.2488466	5.30	0.000	.8314214	1.806882
LPC	10.24754	.8303157	12.34	0.000	8.620148	11.87493
LRINT	2.509216	.8349249	3.01	0.003	.8727937	4.145639
UNEM	-1.423933	.3384926	-4.21	0.000	-2.087366	-.7604997
DEPO	-.9859976	.4451089	-2.22	0.027	-1.858395	-.1136003
DEPY	-.0728882	.1232254	-0.59	0.554	-.3144056	.1686292
_cons	-44.26009	12.94552	-3.42	0.001	-69.63285	-18.88734
sigma_u	0					
sigma_e	2.1951709					
rho	0	(fraction of variance due to u_i)				

APPENDIX E

STATA Output for Tabe 3. Model (RE2)

```
. xtreg SAV INF  LPC  UNEM DEPO DEPY,re

Random-effects GLS regression                   Number of obs      =        95
Group variable: ID                              Number of groups   =         6

R-sq:                                           Obs per group:
     within  = 0.0671                                         min =        15
     between = 0.9282                                         avg =      15.8
     overall = 0.8333                                         max =        16

                                                Wald chi2(5)       =    444.93
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

SAV	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
INF	.5165152	.112846	4.58	0.000	.2953412	.7376892
LPC	8.865377	.622577	14.24	0.000	7.645148	10.08561
UNEM	-.787345	.2387571	-3.30	0.001	-1.2553	-.3193897
DEPO	-.7176246	.4360291	-1.65	0.100	-1.572226	.1369768
DEPY	-.1250436	.108375	-1.15	0.249	-.3374548	.0873675
_cons	-29.76443	10.86369	-2.74	0.006	-51.05688	-8.471983
sigma_u	0					
sigma_e	2.2667939					
rho	0	(fraction of variance due to u_i)				

APPENDIX F

STATA Output for Tabe 3. Model (RE3)

```
. xtreg SAV INF  LPC DEPO DEPY,re

Random-effects GLS regression                   Number of obs     =         96
Group variable: ID                              Number of groups  =          6

R-sq:                                           Obs per group:
     within  = 0.3484                                         min =         16
     between = 0.6581                                         avg =       16.0
     overall = 0.6310                                         max =         16

                                                Wald chi2(4)      =      48.91
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000
```

SAV	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
INF	.0958394	.0697101	1.37	0.169	-.0407899	.2324687
LPC	12.14414	1.826551	6.65	0.000	8.564164	15.72411
DEPO	.2178643	.3156694	0.69	0.490	-.4008363	.836565
DEPY	.3887679	.0900856	4.32	0.000	.2122034	.5653324
_cons	-88.05197	18.28278	-4.82	0.000	-123.8856	-52.21839
sigma_u	4.4556679					
sigma_e	2.3600858					
rho	.78090669	(fraction of variance due to u_i)				